VOL. 9, No. 10 OCTOBER 1955

CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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SCHEDULE OF MEETINGS

4-11 October	**Expert Committee on Insecticides, sixth session, Geneva**
6-12 October	**Study Group on Juvenile Epilepsy, London**
10-15 October	**Expert Committee on Biological Standardization, ninth session, Geneva**
10-16 October	**PASB/WHO: Seminar on Preventive Medicine, Vina del Mar, Chile**
13 October-3 November	**FAO/WHO Seminar on Nutrition Education and Health Education, Baguio, Philippines**
17-22 October	**Study Group on Rehabilitation of the Deaf and Partially Deaf Child, Geneva**
24-28 October	**Study Group on the Measurements of Levels of Health, Geneva**
24-29 October	**Expert Committee on Professional and Technical Education, third session, Geneva**
24-29 October	**Expert Committee on Drugs Liable to Produce Addiction, sixth session, Geneva**
7-11 November	**Study Group on Arteriosclerosis, Geneva**
10-24 November	**International Conference on Yaws Control, Enugu, Nigeria**
15 November-3 December	**Seminar on Public Health Administration, Egypt and Sudan**
17-26 November	**Study Group on Basic Nursing Curriculum, Brussels**
23-26 November	**Study Group on Leptospirosis, Amsterdam**
28 November-2 December	**Study Group on Tuberculosis Control, Luxembourg**
28 November-6 December	**Second African Malaria Conference, Yaba, Lagos, Nigeria**

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PRINTED IN SWITZERLAND

SCHOOL HEALTH SERVICES IN EUROPE

WHO Conference

Within the general framework of services organized for the protection of children, school health services assume a heavy share of responsibility : control of the communicable diseases of childhood ; surveillance of growth and development; the detection of diseases, of physical and mental defects, and of psychological disorders; health education; first aid; and occasionally medical treatment. School health services require constant revision for, although certain health needs of children remain the same and are common to all countries, new problems continually arise to take the places of those which have been solved. Then too, there are special problems which are peculiar to certain parts of the world.

In order to promote the development of programmes designed to meet the health needs of school-age children, WHO created in 1949 an Expert Committee on School Health Services, which devoted its first session to the establishment of general directives and methods of studying ways to improve such services. Pursuant to recommendations of this committee,[1] the WHO Regional Office for Europe arranged for a travelling study group to observe the school health services of Denmark and of the Netherlands in April and May 1953; and, in 1954 in Grenoble, it organized a European Conference on School Health Services, at which twenty-two countries were represented. There were interesting exchanges of views at this conference, the purpose of which was to study the elements essential to school health services, including the legislative provisions governing their organization and the persons engaged in school health activities. What follows is a summary of the report on this conference.

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1951, **30**, 35

SCOPE OF SCHOOL HEALTH SERVICES

In most European countries the proportion of school-age children under the supervision of the school health services is high; in the United Kingdom, for example, 99% of children in this age-group are covered by school health services. However, owing to lack of school medical officers and the necessary material resources, the percentage is very low in certain other countries.

Although in general the existing school health services meet the needs of elementary-school children, the same cannot be said with regard to those attending secondary and technical schools. In about half the countries of Europe, secondary-school children are not subject to medical supervision, or are examined only when the educational authorities themselves take the initiative. The same applies to children attending private schools. In many countries, the school health services do not cover technical and professional institutions, even though the pupils in such schools are required to make a greater effort than those of the same age attending non-technical ones.

With regard to universities, it would be desirable to adopt universally the practice of preventive medical examination, with special emphasis on systematic detection of pathological conditions—tuberculosis, in particular —which constitute a danger to the group. However, a general clinical examination for the purpose of informing the student of his state of health could be optional.

To avoid the risk of tuberculous infection among schoolchildren, persons working or living in schools should be subject in all countries to compulsory radiological examinations, the intervals between such examinations to be determined according to local facilities and conditions. In France, all teachers undergo such an examination every two years, and even more frequently if the medical officer deems it necessary. Teachers infected with tuberculosis must give up their posts, and they are granted leave with pay to enable them to be treated over a number of years.

Among other tasks, school health services should be responsible for the hygienic conditions of school premises. In all phases of construction and utilization of school premises, the medical service should ensure that hygienic requirements be met.

Recent years have seen the development of medical services for the correction of defects for which no specialized care was previously provided—for example, speech therapy clinics for children affected with stammering or suffering from the effects of hare-lip, and podological clinics for the examination and treatment of defects such as flat-foot. Child guidance clinics are becoming increasingly important, and the conference participants unanimously agreed that mental health could, in the future, play a major part in school health.

As a rule, in the countries where medical practitioners are sufficiently numerous, which is generally the case in Europe, the task of the school health service is one of preventive rather than curative medicine. However, in the economically advanced countries school health services sometimes include specialized clinics. In the United Kingdom, for example, where the school medical service is essentially preventive, the local education authorities are responsible for the functioning of about 1900 clinics for the treatment of schoolchildren suffering from minor ailments; 1300 dental clinics; 500 ophthalmological clinics; 200 orthopaedic clinics; 900 speech therapy clinics; 120 ear, nose, and throat clinics; 170 artificial light treatment clinics; and a few other specialized clinics for the treatment of cardio-rheumatic, paediatric, and, more recently, chiropodological troubles.

In some insufficiently developed countries school health services unquestionably have a curative role to play. Where large numbers of children are suffering from social diseases such as trachoma, malaria, or ringworm, case-finding alone would be of little value: if the necessary medicaments were not administered at school by the teachers, absenteeism would disorganize the whole of the school programme, and the clinics would be overloaded. North Africa is a case in point.

These examples demonstrate that there can be no theoretical and final definition of the scope of school health services. Between purely preventive work, on the one hand, and therapy associated with prevention, on the other, there is a whole range of types of school medical service; and each country must select the type most suited to its economic and social conditions and to its medical resources.

GENERAL ORGANIZATION OF SCHOOL HEALTH SERVICES

In many countries, school medical services are organized on a local or regional basis (town, canton, county, or province), with or without national co-ordination. This applies to Austria, Belgium, part of Germany, Ireland, Luxembourg, the Netherlands, Norway, Spain, Sweden, and Switzerland. The type of organization seems to depend, in fact, principally on the administrative structure of the country concerned, so that if the national administration is centralized, the school health service is also organized at the national level.

The national school health service may be administered—or the various local services of the country co-ordinated—by the ministry of public health (Germany, Iceland, Italy, Monaco, Morocco, the Netherlands, Tunisia), the ministry of education (Algeria, Belgium, France, Greece, Sweden, Switzerland, Turkey, United Kingdom), or these two together (Denmark, Spain). However, whether or not the school health service is centralized, liaison at both local and central levels between educational authorities and health authorities is essential. In the United Kingdom, the same medical officer is in charge of school health matters in the Ministry of Education and the Ministry of Health. In Norway, the director of the school health services is also adviser to the ministry responsible for education. In Finland, the school health services, which have previously been the responsibility of the educational authorities, will henceforth be entrusted to the health ministry. The aim of this transfer is to ensure continuous supervision of the health of children from birth to adolescence.

THE SCHOOL HEALTH TEAM

Whatever the number and type of staff available, it is essential that school health programmes be planned and implemented in a spirit of co-operation by the various people responsible for children's health. School health teams—very complete in a number of European countries—generally comprise school doctors, school nurses or assistants, health educators, pupils' families, and, on occasion, other doctors such as general practitioners, social service medical officers, and specialists.

School medical officers

In the countries belonging to the WHO Region for Europe, school medical officers fall into the following categories: full-time school doctors, specialist or non-specialist, who are either State officials serving local communities, or doctors working under government contract; public health physicians who act as medical officers in schools and elsewhere; private practitioners, often appointed on a permanent basis to supervise the health of a given number of children; district medical officers in certain regions in which the population is very scattered (e.g., certain areas of North Africa, and Norway and Sweden) and in which one medical officer is responsible for all tasks within the compass of social medicine.

The respective advantages and disadvantages of systems based on full- or part-time school doctors have been considerably discussed. It is obvious that the number of full-time school doctors can be somewhat limited, which facilitates their supervision and regulation, and the control of their activity. It is easier to assure the regularity of their work; and, most important, they enjoy the complete co-operation of the teaching staff because they are completely integrated into the educational system.

On the other hand, the inconveniences of a system based on full-time school medical officers are also well recognized: the work of these doctors is not sufficiently varied, which means that a certain lack of interest too frequently marks the performance of their tasks, and the repetition of school medical examinations tends to give them a routine character. The conference participants were aware of the necessity to counteract this tendency and to look for ways of adding interest to the work of the school doctor. It was suggested, for example, that school physicians should have more access to work in hospitals.

The functions of full-time school medical officers were defined as follows at the conference:

(1) Initial examination of children entering school for the first time; periodic and special examinations

during the years of school attendance; medical control examinations and examinations in connexion with vocational guidance, towards the end of the period of study.

(2) Participation in tuberculosis case-finding.

(3) Medical control of teaching staff.

(4) Supervision of follow-up action subsequent to school medical examinations; liaison with general practitioners.

(5) Advice to parents.

(6) Liaison with teachers and participation in school health education programmes.

(7) Liaison with public health medical officers in connexion with case-finding and control of communicable diseases in schools; possible participation in vaccination campaigns.

(8) Sanitary inspection of school premises.

(9) Advice on questions of food hygiene and diet in connexion with school meals; supervision of the health of canteen personnel.

(10) Detection of handicaps in children and medical supervision of the handicapped at school; advice to parents, teachers, and school authorities; being on guard for mental and emotional maladjustments.

(11) Medical supervision of school sports.

(12) Maintenance of health cards and preparation of annual statistics and reports.

(13) Special scientific studies and private research.

(14) Medical supervision of holiday camps.

This list makes no claim to being complete; and, in fact, some participants in the conference expressed reservations with regard to certain items. For example, in the United Kingdom medical examination of teachers, supervision of school sports activities, and control of school meals are not duties of the school medical officer.

In some countries, a full-time school doctor is in charge of 8000 to 10 000 children. This is the case in France, and it was agreed that this is too large a number. In Switzerland, the number is 7000 to 8000; in Yugoslavia, 3000 to 4000. The conference participants were of the opinion that a school doctor responsible for carrying out annual examinations should not have more than 4000 children under his care.

School nurses

The term " school nurse " seems, in general, to refer to personnel who have received basic training in nursing with, in some countries, supplementary training in social work. Nurses who are qualified in both fields are also public health nurses (medico-social assistants).

Administratively, school nurses are attached to various authorities, i.e., to local communities, ministries, or, sometimes, private bodies or other institutions. The countries in which school nurses are mainly on a full-time basis are as follows: Algeria, Belgium, France, Germany, Greece, Monaco, Sweden, Switzerland (towns), and Tunisia. Nurses fulfilling school and other functions are found mainly in Austria (municipal nurses), Italy, Luxembourg, Morocco, Sweden (district nurses), and Switzerland (rural nurses).

As in the case of the school doctors, the conference participants endeavoured to assess the optimum number of children to be entrusted to a school nurse. In Lausanne (Switzerland), 800 children are under the supervision of one school nurse; in Denmark and Sweden, the number is 1500. It seems desirable that a school nurse should not be responsible for more than 1000 to 1500 children.

Teachers

Sometimes children are better known and understood by their teachers than by their families, even if only for the reason that they spend more time—apart from that taken by sleeping—at school than at home.

When a medical examination is to take place, the teacher can indicate any child in whom he has detected sight or hearing defects. Teachers sometimes help in sight-testing and measuring.

The medical examination proper should always be preceded by an exchange of views between teacher and medical officer. Most participants in the conference were of the

opinion that the teacher should be present at the medical examination of young children but that this was not advisable from the period of puberty; it was felt, however, that this matter could be left to the discretion of the doctor in each case, since it is not the actual age of a child that counts but his physiological and mental age.

While it is necessary at all times to respect medical secrecy, it must be recognized that medical supervision loses practically all its value if the teacher is not given pertinent explanations with regard to the medico-pedagogic measures necessary in connexion with a particular child. It is therefore the physician's duty to inform the teacher about such measures, but without revealing any particulars of a family, hereditary, or other private nature, or anything which it is not really in the interests of the child to reveal.

School psychologists

In countries which have school psychologists, they, too, may join in the conversations between physicians and teachers and make their personal observations. School psychologists and doctors establish and use joint questionnaires on nutrition, general state of health of the child, etc.

In the Netherlands, school psychologists are attached to the schools in the large towns; but in the rural areas it is often the school doctor who carries out intelligence tests. These tests make it possible to send mentally backward children to special schools. In Denmark, intelligence tests are carried out as routine practice. The consent of parents is asked for any psychological investigation; and, in this connexion, the teachers attach as much importance to contacts with parents as to the examination itself.

Parental co-operation

In most countries parents are requested to supply the school doctor, either at the beginning of the school year or some time before the examination, with information in writing regarding the child's antecedents. A printed questionnaire is generally used for this purpose, and it must be admitted that the answers are often very vague and even erroneous. Nevertheless, the very fact of having to reply to the questions obliges parents, at least on that day, to concern themselves with the health of the child, and this contributes to their health education. However badly the questionnaire is filled in, it can always furnish interesting information; and this system should be continued even if the school nurses have to be called upon, in some cases, to help parents in filling in these questionnaires.

Only the doctor and his nurse—who, like him, is under the obligation to maintain professional secrecy—must have access to these questionnaires, seeing that they may reveal damaging family secrets which must not be divulged.

The questionnaire may be a useful means of requesting parents' consent to subjecting a child to the tuberculin test, if such consent is necessary.

Although the presence of parents may be desirable when a child is undergoing his first school medical examination—at about six years—it is not generally to be recommended in the case of adolescents.

SCHOOL MEDICAL EXAMINATIONS

Medical examinations constitute a fundamental element in school health. Their purpose is supervision of the health and of the harmonious physical, emotional, and social development of the child.

Premises

The school health centre is a group of several rooms specially reserved for the purpose. It is preferable to install the centre

within the precincts of a school, but one centre may serve several neighbouring schools. If the school population is scattered, the transport of pupils to the health centre is one solution, but this is not always possible.

A medical office in a school (it may be a permanent medical office, the headmaster's study, or even a classroom) has the advantages of keeping pupils in contact with their ordinary surroundings and of avoiding loss of school time; but it does not do away with the necessity for sending children who need thorough and specialized examinations to the school health centre.

It is recommended that wherever it is possible to use, without overloading them, premises normally employed for some health activity (health centres, polyclinics), this should be done. In order to facilitate liaison with the medical service for pre-school-age children, it may be possible to use for the school health service the building in which the maternal and child health services are housed. On the other hand, school medical premises must always be separate from tuberculosis control dispensaries or clinics for children suffering from acute communicable diseases.

In Denmark and other Nordic countries, the general practice is to use health centres in towns and one room of a school in rural areas.

In addition to these various types of fixed premises, there are also special vehicles equipped for school medical activities as a whole, or sometimes for certain special activities, such as radiography or dental care.

It is felt that different premises are required for each type of examination, i.e., the routine examination should preferably be carried out at the school; but, for thorough examination, children should be sent to the school health centre or to a polyvalent health centre. The type of premises used for the examinations depends to a great extent on the density of the school population to be examined, on the resources of the services, and on the availability of polyvalent health centres.

Examination methods

The participants in the conference laid particular stress on the necessity for the detection of sight and hearing defects, thyroid disorders, infantile asthma, and spinal posture defects. With regard to radioscopy and microfilm reproduction of radiography of the lungs, is was agreed that, in order to avoid undesirable psychological reactions on the part of children and parents, all schoolchildren, including those giving a negative tuberculin reaction, could be subjected to radiological examination, which is, in fact, sometimes useful for detecting pulmonary anomalies other than tuberculosis, or forms of cardiopathy which have not been discernible by auscultation.

In the sufficiently developed countries, mental health should occupy an increasingly important place in school health. Even during the course of the medical examination as it is at present carried out, an experienced school doctor can often form an idea of a child's mental health.

Frequency of medical examinations

This was one of the subjects on which there was most discussion. The countries of Europe appear to be divided into two groups—those in favour of, and those against, systematic annual examination. In many countries, in fact, much more thorough examination than the annual routine control is carried out every two to three years.

In Germany, where examination was previously effected every year, recent regulations have introduced the three-year system. In Austria, also, examination is carried out every three years, but children of weak constitution or abnormal behaviour are

subjected to more thorough examination. In Denmark, the school health resources make it possible to carry out fairly thorough examinations every year. In France, the examination is annual, but it is very often more or less automatic, and it has therefore been decided to try out, in certain limited sectors, a system of triennial examination with annual case-finding examination, and examination " on request " when anything abnormal is noted. The examination is carried out every year in Algeria, Greece, Iceland, Italy, and Monaco. In Norway, the principle of systematic triennial examination has been adopted, with annual tests and measuring; any child in whom any abnormality whatever is noted is sent immediately to a health centre. A case-finding examination is carried out at schools annually and comprises a tuberculin test, radiological examination of the lungs, the taking of various measurements, and checking of the sensory organs. In the United Kingdom, the examinations take place at the beginning, in the middle, and at the end of elementary education, it being understood that any child showing any signs of disorder is sent to the nearest school health centre for a thorough examination.

The conference participants considered it undesirable to put forward any recommendations on the periodicity of medical examinations, since this might serve as a pretext in certain underdeveloped countries for the reduction of funds allocated to school health services, with unfortunate consequences for these services. It was unanimously agreed that this would be regrettable since it was precisely in the underdeveloped countries that frequent, systematic examination was most needed. In fact, there could be no question of reducing the activities of the school health services as a whole; it was a matter of the re-distribution of such services so as to make them as effective as possible.

Timing of medical examinations

Whatever the periodicity adopted, the timing of the examinations could be established as follows:

(1) School entrance examination. This establishes the condition of the child's health at the time when he is handed over to the school health service. It is a thorough examination, carried out, if possible, in the presence of the parents.

(2) Examinations during school life (according to the circumstances and the degree of development of school medical services). These examinations include annual control for the detection of social diseases (e.g., tuberculosis, trachoma, malaria) or even semi-annual examinations (e.g., X-ray examinations during adolescence); complete examination about every three years; and special annual examinations for pupils engaging in certain sports activities, children arriving at the age of puberty, and adolescents at the age when their resistance to pulmonary disease is low.

(3) " Request " examinations, the request being made by the physician, teacher, nurse, or parents.

(4) Examinations after any lengthy absence.

(5) Final medical examination at the end of school life, oriented according to the vocation which the pupil intends to follow.

School health statistics and special inquiries

The observations made during school medical examinations do not all lend themselves to statistical presentation. In fact, in many cases the diagnosis is not definite, and the pathological conditions detected are in the very first stages. Nevertheless, it was agreed at the conference that:

. . . it would be an error to oppose all statistical analysis, and there can be no doubt that school health services have been able to supply much precious data on social health and the general condition of the population. For instance, the statistics compiled from

weights and measurements taken in nearly all European countries during and since the Second World War have demonstrated the extent of damage to child health caused by the war and have made it possible to follow every stage of its gradual rehabilitation. . . . The same is also true of the decreased incidence of rickets which has been observed in countries where school meals, with milk and vitamins, are distributed. . . . The fall in tuberculois morbidity, the shift of the period of susceptibility to pulmonary disease to later age-groups in certain countries, and the decrease in the rate of positive reactions to tuberculin tests have been ascertained most frequently by means of statistics obtained from school and university health services.

Although there can be no question of imposing the same methods on all European countries, neighbouring countries which have school populations with the same ethnological, economic, and pathological characteristics would find it an advantage to reach agreement on common standards which would allow useful comparisons to be made throughout a group of countries, and subsequently facilitate utilization of statistics on an international level. The *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* should be made the basis of all statistical work in connexion with diseases during school-age.

In addition, certain special inquiries on such disorders as goitre, asthma, albuminuria, and diabetes among schoolchildren might, instead of being limited to one country, be extended over a group of neighbouring countries.

FOLLOWING UP SCHOOL MEDICAL EXAMINATIONS

Medical activities in schools are of value only in so far as children have the possibility of benefiting from treatment. If there are no such possibilities, the school health services must create them by setting up dispensaries and specialized centres as needed.

Therapeutic measures demand contact with families and co-ordination with the activities of the general health services of the region concerned.

Liaison with families and general practitioners

The success of the school health service will depend on the school doctor and school nurse's keeping in close touch with parents, and on the parents' understanding the significance of the therapeutic measures and following their advice. Well-equipped premises and fully documented files may assist the work, but only proper contact with the family can give human value to the work of the school health team.

Such contacts may be made by personal conversation, which enables the doctor to give the parents detailed explanations and often to receive interesting particulars which throw a clearer light on the case; telephone conversations, the current practice in Sweden, for example; simple notification in writing, giving a routine report on the child's health when no special pathological condition has been detected, or a letter if such a condition has been discovered. In this latter case the doctor will explain the symptoms and suggest the treatment to be applied. In France, for example, a printed letter-card is sent, worded so as to enable the general practitioner to whom the parents forward it to return it to the school health service with his observations, thus making sure that some therapeutic action is taken. Health cards have certain disadvantages: parents lose them, or children forget to bring them on the day of examination.

Contacts with parents provide excellent opportunities for health education of families. Such contacts should, in fact, be established even when there is no pathological condition to discuss.

Liaison with general practitioners is maintained in various ways, according to the country. In some it is considered essential that all communications to the family doctor be transmitted by the family, whose prerogative

must at all times be respected. In a very large number of cases—and the proportion will probably increase as time goes on—it is, in practice, the school health service which is obliged to take the initiative and send the child to a dispensary or to a hospital outpatient department, after the consent of the parents has been obtained.

Liaison with other health services

Maternal and child health services. When a child is admitted to school, it ought to be possible for the school doctor to have the benefit of the knowledge gained by the maternal and child health service which, having followed the child since birth, has been acquainted with him during important phases of his physical and mental development. This liaison is established automatically in all countries where the school health services are administered by the public health services, that is to say, where the same physician directs the maternal and child health centre and the school health service in a given town or district. Where this is not the case, every effort must be made by the school health service to establish a link.

Secondary school, technical school, and university health services. The problem is rather complex when the health services for the various categories of educational establishments do not come under a single administration. In any case, the elementary school health service should always transmit the school medical documents to the secondary schools, and from there they should be passed on to higher educational establishments as the case may be. Nevertheless, the conference participants agreed that it might be preferable to transmit only selected extracts of the medical record card, as the latter may contain information which should remain confidential. For example, the behaviour of a child may have been distinctly asocial at one period of his development, but this does not mean that the child should continue to bear the same label in later life.

Occupational health services. In some countries the question has arisen as to whether it is advisable to transmit school medical documents to occupational health services when a pupil leaves school to become an apprentice or worker. In some cases this might not be in the interests of the young person concerned, as a factory doctor might use certain information obtained from the school medical file to advise against employing him. It was recommended that the greatest discretion be exercised in this respect.

Role of teachers, parents, and pupils

A teacher who sees a child every day, and who has received all the necessary information from the school doctor, is in a position to interrogate a pupil to ascertain whether the necessary steps have been taken, or to incite a pupil and his family to do what has been indicated.

Meetings between parents and teachers make it possible to discuss collective problems, such as overwork in a particular group of children. Some children have an influence on their comrades, and this influence can be used to encourage other pupils to follow up medical recommendations and take an interest in health matters.

DENTAL HYGIENE

In most cases the first visit to the school dental centre is the child's first contact with a dentist, and it may be that the milk teeth—and very often the six-year molars—are in a very bad condition. It is desirable, for this reason, that the school dental service should intervene during the year before the child begins school if the necessary treatment of the six-year molars is to be undertaken in time. This early care is very important and should therefore have priority over other treatment.

During their school life, children should be asked to go twice a year to the dental clinic for a check-up of their teeth and any necessary treatment.

A well-organized school dental service can only be built up by stages—starting with examination and treatment of children in the lower classes and gradually passing to the higher classes. All the necessary treatment should be provided, including orthodontic treatment, where specialists are available.

The financing of school dental services may raise difficult problems, but experience has shown that families will co-operate only if the care is free and if the fees for orthodontic treatment are based on its cost price.

HEALTH AND SCHOOL WORK

All countries recognize that overwork exists in certain types of school, although it may not affect all age-groups. The word " overwork " is not appropriate, for the condition often is one not only of too much work, but also of anxiety arising from a whole set of complex circumstances.

Factors in fatigue

The very varied factors leading to school fatigue may be classified as follows:

(1) Physical factors—
(*a*) journey between home and school;
(*b*) seasons, climate;
(*c*) paid work outside school hours;
(*d*) various amusements;
(*e*) excessive sports activities.

(2) Pedagogic factors—
(*a*) intensive work in secondary and technical establishments, which is especially harmful during the period of puberty;
(*b*) " cramming " as examinations approach, particularly on the part of university students;
(*c*) presence of backward children in classes beyond their level;
(*d*) mistaken orientation of pupils obliged to study subjects for which they have no aptitude; " pushing " of children by parents who are lacking in understanding or are over-ambitious;
(*e*) the presence of more and more physically handicapped children in schools in certain countries as a result of the reduction of infant mortality;
(*f*) overcrowded classes, which make school work heavier;
(*g*) inconvenient timetables because of the shortage of school premises and teachers in certain countries, some of the children attending in the morning and others in the afternoon;
(*h*) distribution of terms and holidays without due regard for health considerations;
(*i*) excessive homework owing to lack of understanding of children's physiological needs on the part of some teachers and to lack of surveillance by parents who allow late work.

(3) Mental factors—
(*a*) family troubles;
(*b*) family atmosphere non-conducive to intellectual work owing to lack of general culture or material resources such as shortage of accommodation, lack of peace and quiet during homework hours, exaggerated participation in domestic work;
(*c*) tension caused by child's consciousness of not having learned his lessons and fear of fault-finding on the part of his parents; such anxiety is as tiring as overwork.

Remedies for fatigue

Although this very complex problem cannot be definitely solved, action could be taken along the following lines:

(1) reduction in the length of classes (lessons of 40 minutes, two free days per week);

(2) prohibition of child labour during the period of compulsory education, or permission in the case of older pupils only and then under very strict control;

(3) adjustment of syllabuses, reduction of size of classes, application of varied and attractive teaching methods, and reduction of homework;

(4) adaptation of teaching to a child's capabilities;

(5) co-operation between teachers;

(6) increased participation by school medical officers in school life, and in the organization of syllabuses and timetables;

(7) respect for hours of sleep and personal life of the child.

The results of investigations undertaken in Sweden in 1939, 1941, and 1943 coincide with the general figures for school work in 1931 in the USA, summarized hereunder:

Age	*Hours of sleep*	*Hours free outside school*	*Total hours not spent on school work*	*Hours of school work daily*	*weekly*
7	12	10	22	2	12
8	11½	9½	21	3	18
9	11½	9	20½	3½	21
10	11½	8	19½	4½	27
11	11	8	19	5	30
12	10½	8	18½	5½	33
13	10	8	18	6	36
14	9½	8	17½	6½	39
15	9½	8	17½	6½	39
16	9	8	17	7	42
17	9	8	17	7	42
18	9	8	17	7	42

The problem of "overwork" in schools can be solved only through the collaboration of teachers and school doctors and with an understanding attitude on the part of parents.

HEALTH EDUCATION IN SCHOOLS

The Expert Committee on School Health Services emphasized in its report the importance of health education in schools, stating: "a school health programme ... [can] help children, during their formative years, to gain an understanding of what health means and how it is achieved and maintained."[2]

The conference participants approved the following health education programme:

Instruction in the fundamental sciences of anatomy, physiology, and the social sciences. Such instruction lies within the field of the educator.

Instruction in general and individual hygiene and in activities aimed at developing physical and mental health: human relations, sports, physical training, and first aid. These subjects would also appear to come within the competence of the educator.

Instruction in preventive medicine and prophylactic measures against social diseases such as tuberculosis and trachoma, which in some countries are particularly common among the school population, or even among the population at large. ... It is desirable that instruction in these matters should be given mainly by doctors or experienced school nurses.

[2] *Wld Hlth Org. techn. Rep. Ser.*, 1951, 30, 16

Certain countries have a tendency to lay too much stress on health education in school programmes, which causes some people to think too much about their health. Moreover, an excess of zeal in health educators may create in children phobias and anxieties which should be avoided. Health educators who approach the problems of alcoholism and tobacco, for example, should not lose sight of the fact that any severe judgement passed, even indirectly, by the school on the family may have serious repercussions on a child's mind.

On the question of sex education, emphasis was laid on the very deep divergencies of opinion and the entirely different angles from which the problem is viewed in different countries, since ethnological, social, moral, and theological factors all play their part. Children often acquire their knowledge of sexual physiology under deplorable conditions; and, for lack of some simple advice on matters of sex, young people may be exposed to more or less serious mental disorders which sometimes disturb their moral development and have an adverse effect on their studies.

In several countries, courses of sex education are given only by teachers who accept the responsibility for such courses or by school medical officers who take an interest

in the question. The syllabuses are sometimes submitted for the approval of the religious authorities. In a secondary school in Lausanne, an interesting method is adopted: the school doctor gives a talk and replies to written questions put to him anonymously by the pupils. An exchange of information among the educational authorities and school doctors in various countries on the results of experiments along this line is desirable.

Finally, it must be remembered that all steps taken with regard to sex education must be optional, and that parents must have an absolute right to decide whether or not their children are to be given such instruction.

DISSEMINATION AND INTER-COUNTRY EXCHANGE OF INFORMATION ON SCHOOL HEALTH SERVICES

The school doctor should not have to rely for information on obsolete papers in which everything on "health in the school" is given in a few dozen pages. If school health is to be vivid and interesting, and if the doctor is to be kept up to date, it is essential that the dissemination of the relevant medical knowledge be properly organized. At the present time, handbooks, journals of scientific societies, etc., are far from meeting the requirements. This applies also to the information available to school nurses.

Among the various methods recommended for dissemination of information and interchange of views on school health services, the conference participants mentioned the creation of special study societies which would be open to medical personnel and all other persons interested in school health. These societies, established on a national level or grouping together persons from neighbouring countries speaking the same language and having the same problems, could subsequently be formed into a European, or even a world, federation, which would maintain close ties with WHO, UNESCO, and the International Children's Centre.

RECENT STUDIES ON TYPHOID AND PARATYPHOID FEVERS

WORLD SURVEY OF TYPHOID AND PARATYPHOID-B PHAGE TYPES

In a recent study, Dr A. Felix[1] reviews the development of the bacteriophage method of typing typhoid and paratyphoid-B bacilli and summarizes data resulting from international co-operation in enteric phage typing—data which he submitted to the International Committee for Enteric Phage Typing on the occasion of its meetings during the Fifth and Sixth International Congresses for Microbiology.

The establishment of the existence of bacteriophages specific for the Vi form of the typhoid bacillus and the subsequent successful production of bacteriophage preparations of high specificity for particular strains have proved to be of great value to epidemiologists. The phage-typing method reveals strain differences which cannot be demonstrated by any of the customary serological methods. So far, thirty-three types and subtypes of *Salmonella typhi* have been accepted for the typing scheme now in use.

Paratyphoid-B fever is more prevalent than typhoid fever, especially in the countries of Europe. During large-scale outbreaks in Great Britain in 1941-43, it was found that it was possible to apply the bacteriophage technique also to the typing of *S. paratyphi B*,

[1] Felix, A. (1955) *Bull. Wld Hlth Org.*, 13, 109

and a typing scheme has been developed which at present includes ten types and a number of subtypes.

Considerable progress has been realized in the international standardization of the typing procedure and of the typing phage preparations, through the offices of the International Committee for Enteric Phage Typing, one of the special committees of the International Association of Microbiologists. This standardization has done much to facilitate epidemiological investigations and to further the control of the enteric fevers. Co-ordinated studies of the theoretical and practical aspects of the phage-typing methods are being conducted on an international basis.

Dr Felix stresses the necessity of calculating frequency distribution of types by counting the number of foci due to infection with a given phage type rather than the number of cases or cultures examined. He considers it advisable to count as *one* focus any number of sporadic cases that are known to be connected with each other and to count separately those cases in which such relationship is unknown or doubtful. While this method still leaves a wide margin of error, it gives a more accurate picture of the true distribution of the different phage types and of strains that remain untypable.

The first survey of the geographical distribution of typhoid Vi-phage types, which was carried out in 1950, revealed that the most common typhoid Vi-phage type throughout the world is apparently Type E_1, and that certain types that are rare, or that do not occur at all, in some parts of the world are quite common in others. A second survey, in 1953, covering 27 countries and including the examination of about 15 000 patients, led to the same conclusions.

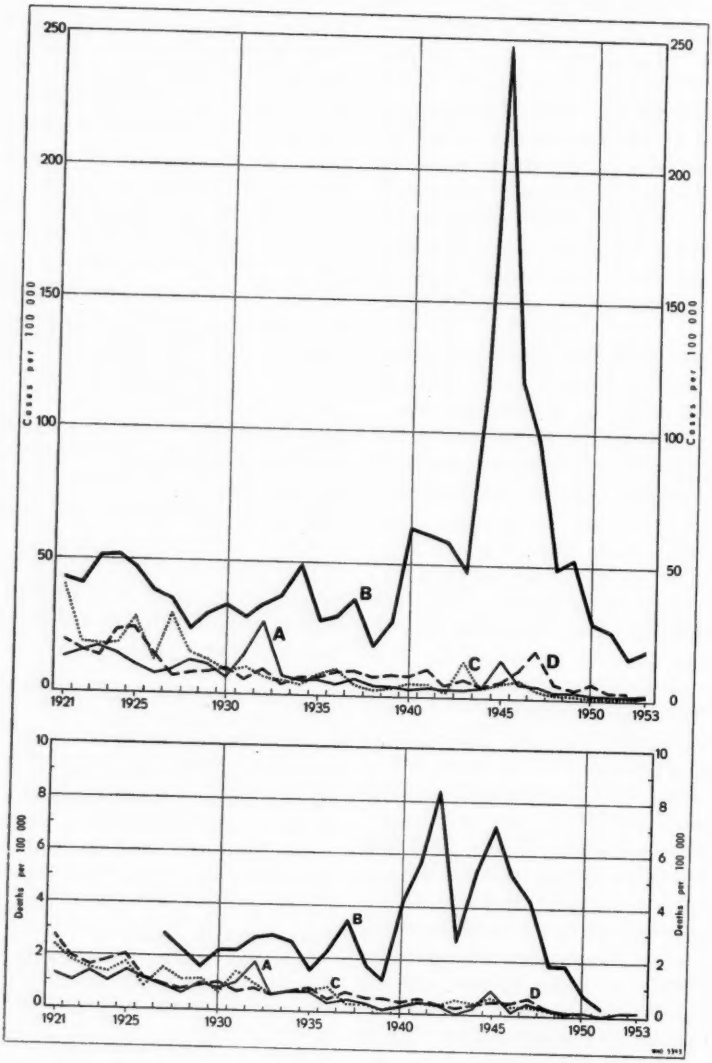
With regard to paratyphoid-B phage types, an investigation in 1953 of approximately 12 000 patients showed that, in nearly all the countries on the continent of Europe, Type " Taunton " was the one most prevalent. Observations in Canada, however, gave evidence of a quite different type distribution. It was also found that the percentage of paratyphoid-B strains that remained untypable by means of the first ten standardized phage preparations was considerably lower than the combined figures for " untypable " and " degraded " Vi strains of the typhoid bacillus—a finding that seemed to confirm an earlier impression that the total number of existing phage types of *S. paratyphi B* may not be as great as that of *S. typhi*.

Work is going forward on the further subdivision of the most common phage types. Efforts are also being made to phage-type paratyphoid A, which is indigenous to many parts of Asia and Africa but almost nonexistent in Europe and America, except for imported infections. On the other hand, it is considered unnecessary to attempt international standardization of the phage typing of other members of the Salmonella group, such as *S. typhi-murium*, the most frequent cause of food poisoning in man.

Dr Felix points out the public health value of phage typing of the typhoid and paratyphoid bacilli and of world-wide surveys of phage types:

> . . . In the present era of rapid traffic from one part of the globe to another, it is . . . most helpful to public-health authorities to be in possession of up-to-date information regarding phage types that are characteristic of certain countries or regions, from which a patient or carrier originates or through which he, or she, may have travelled in transit.
>
> On the basis of this knowledge the phage-typing centre of any country may occasionally identify a source of infection which is hundreds or thousands of miles away and which has escaped detection by the local health authorities. . . .
>
> In addition to their practical value for epidemiological purposes, regular surveys of typhoid and paratyphoid-B phage types conducted on a global scale are of importance also from the theoretical point of view. . . . The different phage types and the latent natural phages they produce are destined to play an important part in the study of the genetics of these species and of related organisms.

FIG. 1. ANNUAL INCIDENCE OF TYPHOID AND PARATYPHOID FEVERS : NORTHERN EUROPE, 1921-53 (RATES PER 100 000 INHABITANTS)



A — *Denmark* B — *Finland* C — *Norway* D — *Sweden*

TYPHOID AND PARATYPHOID MORBIDITY AND MORTALITY FROM 1950 TO 1953

Data collected by the WHO epidemiological and statistical services have provided the basis for a report [2] on cases of, and deaths from, typhoid and paratyphoid fevers in different parts of the world from 1950 to 1953. This report reveals a continuing downward trend in the incidence of typhoid and paratyphoid fevers in a number of countries.

Europe

In northern Europe (Denmark, Finland, Norway, Sweden), death-rates from typhoid and paratyphoid fevers were negligible during the period under review, the highest rate being 0.7 (Finland, 1950). Except in Sweden, the number of cases was consistently below the 1943-49 median. Paratyphoid was more prevalent than typhoid.

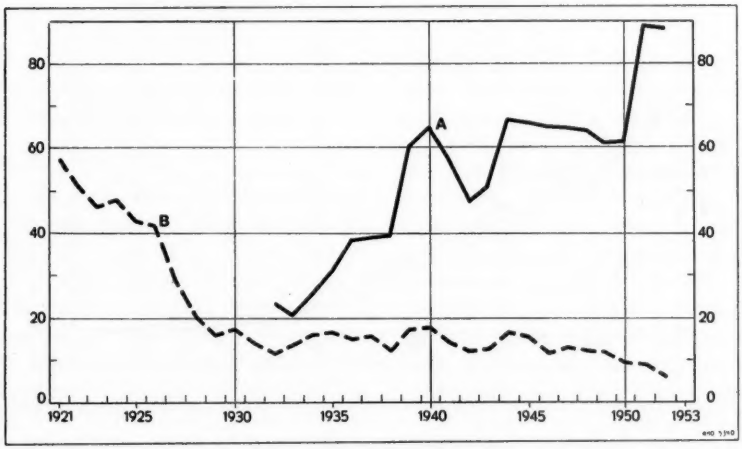
Death-rates in central Europe (Austria, Federal Republic of Germany, Switzerland) were generally somewhat higher than in northern Europe, ranging from 0.08 (Switzerland, 1951) to 2.1 (Austria, 1950). In varying degrees paratyphoid infections appeared to be more frequent than typhoid ones.

For all the countries of western Europe (Belgium, France, Ireland, Netherlands, United Kingdom), the number of cases of typhoid for the period 1950-53 was below the 1943-49 median. England and Wales and Scotland had the lowest death-rates. With regard to paratyphoid, only the Netherlands showed a decrease in prevalence. Preeminence of paratyphoid over typhoid infections was noticeable in Scotland, the Netherlands, and England and Wales.

The highest death-rates on the Continent were in southern Europe (Portugal [mainland], Spain, Italy, Yugoslavia, Greece). However, for all the countries in this area, the figures for the period reviewed were consistently below the 1943-49 median, except with regard to paratyphoid in Yugoslavia. In contrast with the other parts of Europe, in this region

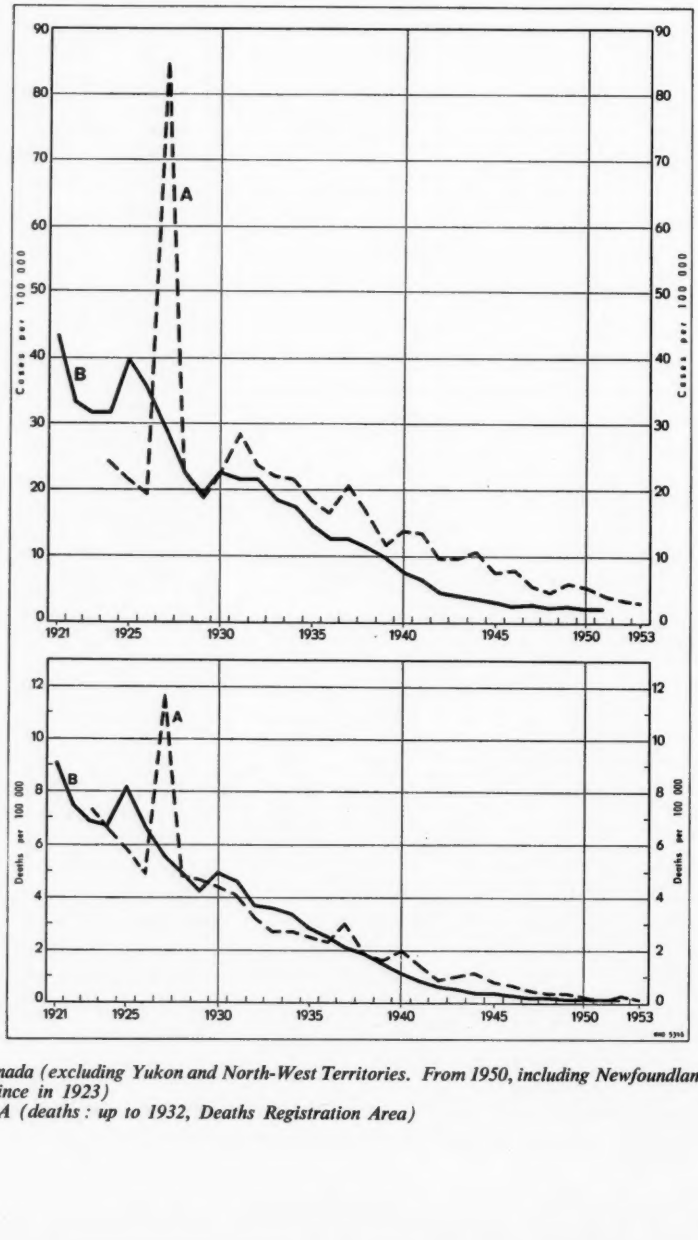
[2] *Bull. Wld Hlth Org.*, 1955, **13**, 173

FIG. 2. ANNUAL INCIDENCE OF TYPHOID AND PARATYPHOID FEVERS : CHILE, 1921-53 (RATES PER 100 000 INHABITANTS)



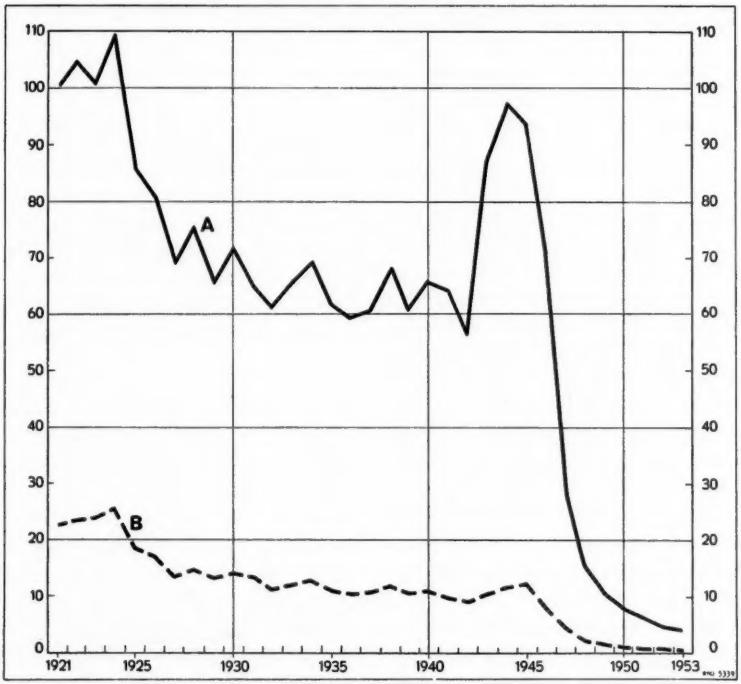
A — *Cases per 100 000* B — *Deaths per 100 000*

FIG. 3. ANNUAL INCIDENCE OF TYPHOID AND PARATYPHOID FEVERS : CANADA AND USA, 1921-53 (RATES PER 100 000 INHABITANTS)



A — *Canada (excluding Yukon and North-West Territories. From 1950, including Newfoundland. Excluding Quebec Province in 1923)*
B — *USA (deaths : up to 1932, Deaths Registration Area)*

FIG. 4. ANNUAL INCIDENCE OF TYPHOID AND PARATYPHOID FEVERS : JAPAN, 1921-53 (RATES PER 100 000 INHABITANTS)



A — *Cases per 100 000* B — *Deaths per 100 000*

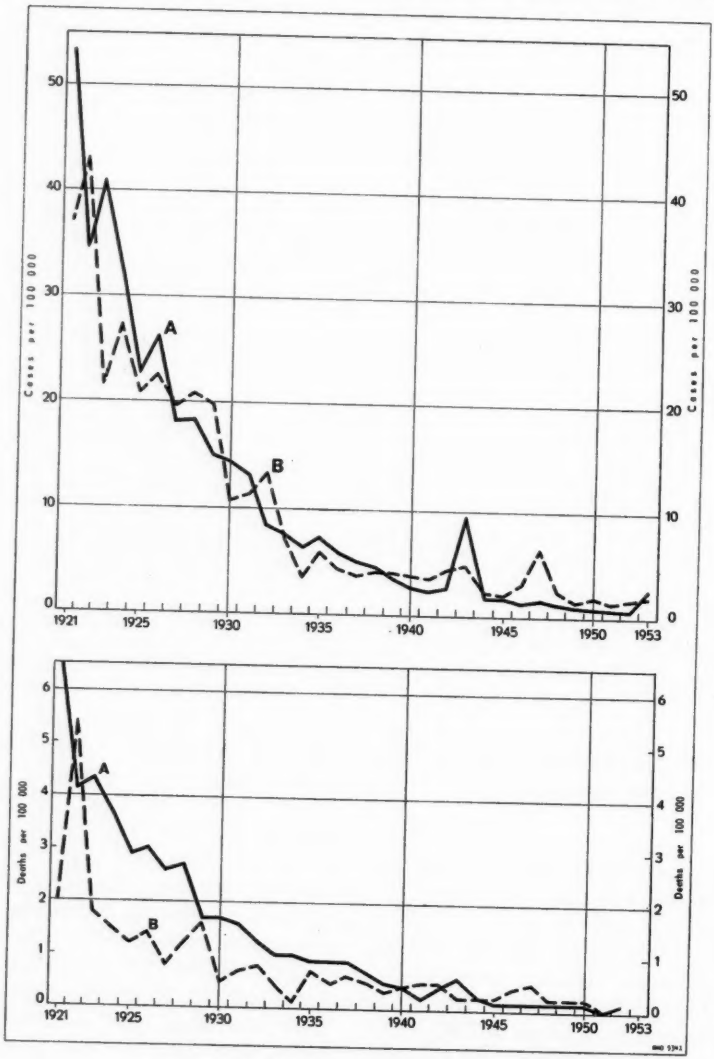
typhoid infections appeared to be far more common than the paratyphoid ones.

Americas

For the countries for which data are presented, Canada and the USA showed the lowest (fig. 3), and Mexico the highest, death-rates. In Canada and the USA the number of cases of typhoid fever reported was below the 1943-49 median. The reverse was true—except for Canada in 1952—in so far as the reporting of paratyphoid cases was concerned. In Mexico and Canada, cases of typhoid outnumbered those of paratyphoid, while in the USA in 1952 and 1953 about 1900 more cases of paratyphoid than of typhoid fever were reported.

For Central American countries (Costa Rica, El Salvador, Guatemala, Nicaragua), no separate data were available for the two types of infection. Except in Costa Rica, there was no apparent decrease in the number of cases as compared with the median for 1943-49. In the Caribbean countries (Cuba, Jamaica, Haiti, Dominican Republic, Puerto Rico, Martinique), on the other hand, the figures were below the 1943-49 median, with a few exceptions—Haiti in 1952, Martinique in 1950, and the Dominican Republic. In the rest of the continent (Bolivia, Brazil, Chile,

FIG. 5. ANNUAL INCIDENCE OF TYPHOID AND PARATYPHOID FEVERS : AUSTRALIA AND NEW ZEALAND, 1921-53 (RATES PER 100 000 INHABITANTS)



A — *Australia (deaths: excluding full-blood aboriginals)*
B — *New Zealand (excluding Maoris)*

Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela), Ecuador, Peru, and Chile (see fig. 2) showed figures above the median, though this might be at least partially attributable to better reporting.

Africa

Except in Egypt, where the number of cases in 1953 doubled the 1943-49 median, the number of cases of typhoid and paratyphoid in the North African countries reporting them was below the median. In the rest of the continent, with the exception of Madagascar and Mauritius, the cases reported were consistently above the median.

Asia

An increase in incidence of typhoid and paratyphoid fevers, as compared with the 1943-49 median, was noted in Hong Kong, Israel, Syria, and Turkey. The situation seemed stationary in Ceylon, the Federation of Malaya, and Singapore Colony; and there was a decrease as compared with the median in Formosa, Sarawak, and the Philippines (except for 1950). Japan experienced a noteworthy drop in the number of cases (see fig. 4), possibly as a result of a mass vaccination campaign undertaken in that country.

In all the countries of Asia for which data were available, typhoid infections considerably outnumbered paratyphoid ones.

Oceania

Here also, the number of typhoid cases was greater than that of paratyphoid. No definite trend in prevalence could be seen in the countries of this area except, perhaps, in Western Samoa, where the number of typhoid cases was below the 1947-49 median.

Conclusions

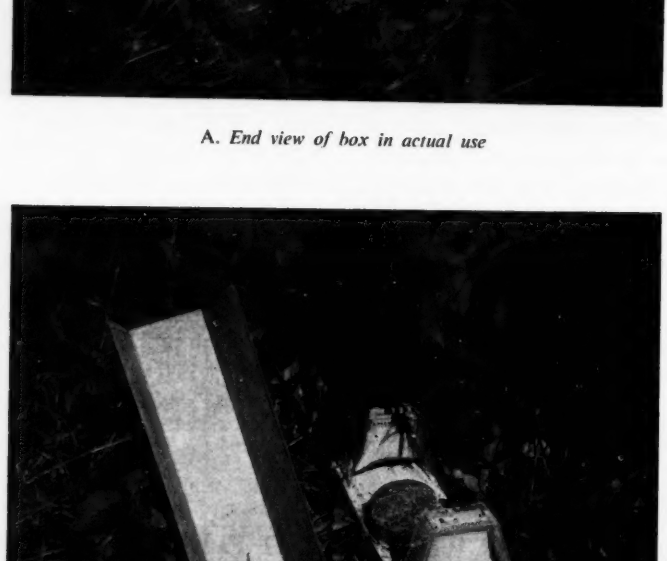
It is difficult to draw any conclusions from the data available since the number of cases of typhoid and paratyphoid fevers registered by national administrations represents only a variable fraction of the actual cases, the total number of which cannot be assessed. However, it seems that during the period under review the prevalence of water-borne typhoid fever was very low and tending to zero in countries with a large urban population enjoying protected water-supplies and a temperate climate, whereas food-borne paratyphoid infections, while generally decreasing, had not yet reached a negligible level. On the other hand, in predominantly rural areas, both in the temperate climate and in tropical countries and territories, typhoid fever prevalence remained high; and, judging from the mortality data available, this infection was definitely more important as a public health problem than the paratyphoid fevers.

CONTROL OF WILD-RODENT FLEAS IN HAWAII

In Hawaii, in the Hamakua District, wild-rodent plague is rife in a coastal strip 32 km long and 8 km wide. In this area there is a stable rat population, as the rodents find plentiful food throughout the year. Their burrows are protected by dense vegetation composed of guava shrubs, banana trees, mango trees, and ferns, or they are hidden in the fields of sugar-cane. For these reasons rodenticide operations which have extended over a number of years have not been successful: there seems to be no indication of a

FIG. 1. METAL HOOD-TYPE DDT BAIT-BOX

A. *End view of box in actual use*



B. *Box with hood removed, showing full DDT sacks and bait container with rolled oats.*

decline in wild-rodent plague, and periods of quiescence are consistently broken by epizootic outbreaks.

There are also serious difficulties in controlling fleas on the wild rodents. For example, indiscriminate use of insecticides involves the risk of destroying the entomophagous parasites introduced into the country at great expense to combat sugar-cane pests. Moreover, there might be a possibility that traces of insecticide spread over the fields could pass into the raw sugar product.

Finally, in the lush vegetation and almost impenetrable fields of sugar-cane, it is practically impossible to reach the rat burrows for direct dusting with residual insecticides.

Under these special circumstances, the question arose of developing a method of using the rat itself as the contactor and disseminator of the insecticide, transporting it into its burrow; in this way, waste of DDT and the indiscriminate spreading of insecticide would be avoided. L. Kartman & R. P. Lonergan have described, in a recent article in the *Bulletin of the World Health Organization*,[1] a method which has given sufficiently encouraging results to justify application in other zones in which plague is endemic.

Metal bait-boxes were constructed, containing bait in the form of pieces of coconut, or rolled oats. When the rat entered the box, it released a mechanism which " showered " it with DDT powder mixed with pyrophyllite; when it left the box, through the operation of a similar mechanism it received a second dusting. In addition, the DDT which fell to the bottom of the box served to coat the underside of the rat.

Stations for the capture of live rats were installed along about 1.2 km, at intervals of approximately 15 m from each other. At every fifth station there was a DDT bait-box. All captured rats were anaesthetized, combed for ectoparasites (which were counted), marked, and freed. Rats taken in traps without DDT were used as controls. Where possible, in the treated zone and in the control zone, burrows were opened and nests examined to obtain data on any possible effects of DDT transported into the burrows by " treated " rats.

The predominant species of rats in the test area were *Rattus rattus* and subspecies, and *R. hawaiiensis*.

The purpose of this experiment was to discover whether it would be possible to reduce the flea indices on wild rats to a level which would prevent enzootic plague from developing into an epizootic. Percentage evaluation of the results was complicated by the very small number of fleas on rats in the test area. Nevertheless, it was possible to observe a difference of 9% in the rate of infestation as between " treated " and " control " *R. rattus*, and of 18% as between the two groups of *R. hawaiiensis*. The rat-flea indices were: *R. rattus*—0.20 in the controls, and 0.13 in the " treated " rodents; *R. hawaiiensis*—0.30 and 0.08, respectively.

Only twenty nests could be examined intact, but it was found that the DDT introduced into the burrows by the rats had practically suppressed flea infestation. In a nest of *R. hawaiiensis*, chemical analysis revealed 0.720 mg of DDT and 0.014 mg of DDE, of 112.6 g of material examined.

These results, although still partial and provisional only, suggest that the use of DDT bait-boxes may be of considerable value in the control of rodent ectoparasites. The authors propose that the method described be tested on a large scale in zones where plague is endemic for at least a year or for a period sufficient to include significant fluctuations in meteorological conditions and flea indices on field rats.

[1] Kartman, L. & Lonergan, R. P. (1955) *Bull. Wld Hlth Org.*, 13, 49

AUXILIARY HEALTH WORKERS IN THE EASTERN MEDITERRANEAN REGION*

In the countries of the Eastern Mediterranean Region, the ratio of doctors to population ranges from about 1 to 8000 to 1 to 60 000. There are even countries which do not yet have a single doctor of their own, the entire medical profession being represented by a few foreigners. Some countries with populations of up to five million have no medical schools.

The nursing situation is no better. In the whole Region of approximately 170 million people, there are perhaps not more than five or six schools of nursing which would be regarded as adequate by modern standards. The training of other types of professional health staff is similar.

Faced with such a shortage of health personnel and training facilities, many countries of the Region are resorting to the training of large numbers of auxiliary health workers as an emergency solution until adequate professional staff becomes available. In general, this training is concerned with three types of auxiliaries: (1) those substituting for doctors, (2) those substituting for nurses and midwives, and (3) those substituting for sanitarians.

Auxiliary doctors

The use of auxiliary doctors has been best developed in Iran, Pakistan, and Sudan. In the first two countries the tendency has been to concentrate on medical care, with no particular emphasis on training in public health and preventive medicine. In Sudan, a simpler type of auxiliary—the medical assistant—has been developed. Training of medical assistants began in Sudan as early as 1919, on a more or less apprenticeship basis, and has been formalized since 1946. Until recently candidates were selected from among men who had already had training as dressers or nurses; they were given an additional 18 months' training in medical care and public health. More recently, another school has been developed which offers a three-year course to boys who have had no previous experience. At present more than four hundred of these medical assistants are employed in Sudan, mainly in dispensaries in rural and semi-rural areas.

In co-operation with the United States Foreign Operations Administration (USFOA), a school for training a similar type of medical assistant is being developed at Gondar, Ethiopia. In this school greater emphasis is being placed on preventive medicine and public health training. When fully established, the school should train 30 assistants annually, to help meet the needs of rural health services in particular.

Auxiliary nurses and midwives

There are two main groups of auxiliary nurses: hospital nurses, and public-health nurses. The former are trained to assist professional hospital nurses; ideally they work under the close supervision of fully qualified professional workers and are subjected to continuous in-service training. A useful hospital auxiliary nurse can be trained in about six months. Where possible, arrangements may be made for the best of these auxiliaries to complete a full, professional, training course.

* Based on an article by Dr J. D. Cottrell, Director of Health Services of the WHO Eastern Mediterranean Region, which was published in *J. Amer. med. Wom. Ass.*, 1955, **10**, 237

Training of auxiliary public-health nurses has been developed in Egypt and Pakistan for some years; and, with the aid of WHO and USFOA, training courses have been instituted in other countries of the Eastern Mediterranean Region, including Ethiopia, Iran, Iraq, Libya, and Syria. The training of these auxiliaries should last at least twelve, and preferably eighteen, months. The instruction covers a wide variety of subjects: health care and nursing the sick, especially children; environmental sanitation, with special stress on personal hygiene; control of the communicable diseases which are common in the area; elementary nutrition, especially in relation to local foods; maternal and child health care at the nursing level; and health education.

A somewhat similar type of worker, but with additional midwifery training at a higher level, is being graduated from schools developed in Pakistan with the assistance of WHO and UNICEF. The Ministry of Health has been aided in the establishment of four schools for this type of auxiliary. The course lasts 27 months. A special effort is made to prepare the trainees to teach the indigenous midwives in the area where they will work.

With regard to the training of auxiliary midwives, an attempt is being made to orient such training towards public health and preventive practice, preparing community midwives to provide simple care at the village level for the mother and child before and during birth and continuing care for the child up to school-entry age. A particularly valuable system of training has been developed in Sudan, where there are now about six schools giving an eight-month course for semi-literate or completely illiterate village midwives who subsequently are provided by the Government with a simple midwifery kit and are licensed to practise midwifery, usually in their own villages. These midwives, however, are kept under strict supervision by the district health authorities, are recalled for refresher courses, and may, in extreme cases of incompetence, lose their licences.

Auxiliary sanitarians

In the countries of the Eastern Mediterranean Region, there is need not only for sanitary engineers and fully trained sanitary inspectors, but also for auxiliary sanitary inspectors. In countries where health services are at a very early stage of development, this may be one of the first types of auxiliary to be trained.

The WHO Regional Office has recently arranged for the Egyptian Government to conduct a one-year course, in Arabic, for auxiliary sanitary inspectors from nearby countries where such training is not yet given. These auxiliaries receive a thorough practical training, within limits, in all aspects of environmental sanitation appropriate to the type of community in which they will later serve.

On a higher level, a number of countries—including Cyprus, Sudan, and Pakistan—are training sanitary inspectors according to the syllabus of the Royal Sanitary Institute in London.

* * *

The use of trained auxiliary health workers is giving good results in many countries, but it must be stressed that careful planning is necessary before a government embarks upon training programmes and establishes services based on the use of auxiliary workers. With careful planning, a reasonably adequate health service for rural areas, in particular, can be built up at low cost in the course of one or two decades, pending the time when fully trained professional health and teaching personnel is available.

Notes and News

Study Group on Juvenile Epilepsy

A WHO study group, comprising twelve internationally known experts actively working on different aspects of the problem of juvenile epilepsy, is meeting in London from 6 to 12 October. The purpose of this meeting is to survey current knowledge and developments in research, treatment, care, and services relevant to epileptic children. This entails a review of work in many fields, including neurophysiology, electroencephalography, pharmacology, psychiatry, paediatrics, psychiatric social work, and public health practice.

Each member of the group has been asked to supply information on the services in his own country for the care and treatment of epileptic children, answering the following questions:

(1) What arrangements exist for the ascertainment or registration of epileptic children —either locally or nationally?

(2) What arrangements are provided by the national or local educational authorities for special schools, home tutors, or other special educational provision for epileptic children?

(3) What voluntary bodies exist to promote or provide the medical, social, or educational care of epileptic children?

(4) What professional organizations of physicians exist which are specially concerned with the investigation and care of epileptic children?

Dr D. A. Pond, of the Institute of Psychiatry of London University, acting as a short-term consultant for WHO, has prepared a preliminary working paper briefly outlining the present state of knowledge of juvenile epilepsy, to serve as a starting point for the group's discussions. These discussions are expected to cover subjects such as juvenile epilepsy from the physiological and the paediatric points of view; the genetic aspects of the problem; personality and behaviour disorders associated with juvenile epilepsy; the " borderlands " of epilepsy; a community programme for epileptic children; and epilepsy as a public health problem.

Professor Fraser Brockington, of the Department of Social and Preventive Medicine of Manchester University (United Kingdom), is Chairman of the study group. The other members are: Dr Romanes Davidson, Medical Superintendent, Orphan Homes of Scotland, Bridge of Weir (United Kingdom); Professor H. Gastaut, Faculty of Medicine, Marseilles (France); Dr Peter Henderson, Principal Medical Officer, Ministry of Education, London (United Kingdom); Dr H. Landolt, Medical Director, Schweizerische Anstalt für Epileptische, Zürich (Switzerland); Dr B. Ch. Ledeboer, Secretary-General, International League against Epilepsy, Haarlem (Netherlands); Dr William Lennox, Neurological Institute of the Children's Medical Center, Boston, Mass. (USA); Dr Karl-Axel Melin, Medical Director, Clinic for Convulsive Disorders, Stockholm (Sweden); Dr Julius Metrakos, Department of Genetics, Children's Hospital, Montreal (Canada); Dr D. A. Pond, Department of Clinical Neurophysiology, Institute of Psychiatry, Maudsley Hospital, London (United Kingdom); Dr F. Sal y Rosas, Lima (Peru); and Dr Hans Strotzka, University Psychiatric Clinic, Vienna (Austria).

FAO/WHO Seminar on Nutrition Education and Health Education

The World Health Organization and the Food and Agriculture Organization are sponsoring a joint seminar on nutrition education and health education, which is being held from 10 October to 2 November 1955 in Baguio, Philippines, with the Government of the Republic of the Philippines as the host country.

Approximately sixty participants from twenty-four countries and territories will attend the seminar as professional leaders engaged in nutrition education and health education work. They will include public health medical officers, agriculturists, nutritionists, educationists, nurses, health educationists, cultural anthropologists, home economists, social welfare workers, and publicists. Representatives from the United Nations, UNESCO, UNICEF, US International Co-operation Administration (ICA), and the South Pacific Commission have also been invited to take part in the seminar.

The main purposes of the seminar are as follows:

(*a*) to exchange information and ideas about the nutrition education and health education programmes now in progress in the participating countries and territories and to discuss the major problems encountered;

(*b*) to explore the basic principles underlying modern health education and to develop a common working philosophy for improving health education and nutrition education in the participating countries and territories;

(*c*) to observe and to demonstrate some of the methods and techniques of health education, with special reference to nutrition;

(*d*) to develop practical plans for expanding and improving nutrition education and health education, having regard to existing conditions and resources in the various areas.

A very important aspect of the preparatory work during the past year for this seminar has been the convening of preliminary meetings in a majority of the participating countries and territories by the governmental authorities concerned, in collaboration with the WHO Regional Office for the Western Pacific, the WHO Regional Office for South-East Asia, and the Food and Agriculture Organization. In almost every country representatives from the departments of education, health, agriculture, and sometimes from ministries of planning or social affairs have participated in these pre-seminar meetings to assist in developing the organization and content of the seminar programme.

The main topics to be considered at this seminar, with nutrition education as the focal point, include the following: (1) the principles and process of learning; (2) investigation of sociological factors and their relation to changing attitudes, beliefs, and habits; (3) study of the educational methods and approaches most suitable under different circumstances; (4) discussion of the health education concepts and experiences needed in the training of personnel at various levels; (5) principles of planning, organization, and coordination of education services in health, nutrition, education, home economics, agriculture, and other relevant fields; and (6) consideration of the various methods of evaluating the effectiveness of educational programmes and the usefulness of specific educational methods and materials.

Study Group on the Rehabilitation of the Deaf Child

In infants and young children the existence of impaired hearing is a handicap which may easily be unsuspected, since it is not usually associated with obvious signs of disability. The effects of the handicap are, however, of particular importance at this age: if the impairment is severe and is not treated, speech development will be affected, thus depriving the child of normal means of communication; education becomes a special problem; and emotional maladjustment is likely to occur. Although health and education authorities have, in the past, given considerable attention to the problem of training and educating children with impaired hearing, their efforts have been directed mainly towards providing services for children old enough to attend a nursery or primary school.

WHO is convening, in Geneva from 17 to 22 October 1955, a study group to consider questions associated with rehabilitation of the deaf and partially deaf child. The whole approach to the problem of children with impaired hearing has been influenced by comparatively recent developments in audiology. It has been shown that most children with a hearing handicap, even those who are

born deaf, have some residual hearing. The aim now is early detection and training to enable the young deaf child to develop hearing and speech in the way that a normal child would, primarily through listening. The training advocated is based upon the " auditory " method, adding the visual (lip reading) method at a later stage.

In a few centres where audiology units have already been set up, these are usually associated with university departments of otorhinolaryngology and work in co-operation with public health and education authorities. Where auditory training programmes have been successfully established, it has been found that the majority of young children with hearing loss can be trained during the pre-school years so that they are able to attend ordinary school by the age of 5 or 6, that only a few need to attend a special class or school.

The success of such programmes will, however, depend upon appreciation by all concerned with young children of the need to diagnose hearing impairments in infancy or early childhood, and to start training at the earliest possible age. This requires co-operation and team-work among otologists, paediatricians, maternal and child health and school health staff, audiologists, psychologists, teachers, and parents. Education of the public is also a very important factor.

In convening this study group, to which UNESCO, the United Nations, and the ILO have been invited to send participants, WHO supports the view that the ascertainment and management of hearing handicaps in children should be more widely recognized as a public health problem, and that medical and health authorities have a major responsibility in this field. The main topics of discussion will be the prevention of hearing handicaps in children, methods of case-finding, diagnosis (particularly in young children), treatment, and rehabilitation, including the organization of training and education programmes. It is hoped that the study group will provide guidance on ways of meeting the problem of the child with a hearing handicap along lines which are mutually acceptable to health and to education authorities.

The members of the study group will include a clinical otologist, a paediatrician, two audiologists, and a public health administrator, invited by WHO; two specialists in education of the deaf, invited by UNESCO; representatives of the United Nations and of the ILO; and members of the UNESCO and WHO secretariats.

Study Group on Arteriosclerosis

WHO has, up to the present, concentrated its work in nutrition on problems of undernutrition and dietary deficiency diseases. While continuing its efforts in this domain, the Organization is now turning its attention also to other relationships between diet and health, specifically to the possible relationship between habitual diet and cardiovascular diseases in the more highly developed countries and among certain segments of the population in many other countries.

Degenerative heart disease is the most frequent cause of death in North America, in most of Europe, and in the more prosperous communities of countries in other parts of the world. This is true not only of the aged, but also of all ages beyond the third decade of life. The increasing dominance of degenerative heart disease is not explicable on the basis solely of the decreasing importance of other causes of mortality or of the changing structure of the population.

The etiology of degenerative heart diseases needs clarification. These diseases have the following characteristics, study of which might contribute to better understanding of their etiology:

(1) They cause widespread morbidity, invalidism, and mortality.

(2) Although they are not caused by infective agents, they have some of the characteristics associated with diseases of this nature. They are more prevalent in some countries than in others, and in certain countries the high incidence of such diseases is confined largely to certain population groups.

(3) Present evidence indicates that the distribution of degenerative heart diseases is

not so much racial or geographical as related to environmental factors.

WHO, as an international co-ordinator of health programmes, can help to initiate, and perhaps correlate, studies that might be carried out in many different countries. The Regional Committee for Europe and the Joint FAO/WHO Expert Committee on Nutrition [1] have both suggested that the Organization might give consideration to the public health aspects of cardiovascular diseases. Accordingly, the Organization is convening a study group to advise on the steps that WHO could take to assist in furthering knowledge which might lead to effective prevention of degenerative heart diseases. This study group will meet in Geneva from 7 to 11 November. The following disciplines will be represented: epidemiology, statistics, cardiology, pathology, experimental medicine, biochemistry, and nutrition. It is expected that there will be about eleven participants, from Canada, France, Japan, the Netherlands, Sweden, the United Kingdom of Great Britain and Northern Ireland, and the USA.

Second International Conference on Yaws Control

A second international conference on yaws control is being held, with the co-operation of the Government of Nigeria, in Enugu, the chief town of the Eastern Region of Nigeria, from 10 to 24 November 1955. This conference is the fulfilment of recommendations made at the First International Symposium on Yaws Control, which was held in Bangkok, Thailand, in 1952, and by the Expert Committee on Venereal Infections and Treponematoses at its fourth session, in the same year.

At the Symposium the position of yaws control up to that date was discussed. Special attention was paid to the results obtained with the long-acting penicillin preparation procaine penicillin G in oil with 2% aluminium monostearate (PAM), which had made possible the success of extensive yaws campaigns. Consideration was given to the best ways of using this new preparation.

[1] See *Chron. Wld Hlth Org.*, 1955, 9, 209.

At the conference to be held in Nigeria, the developments that have taken place in yaws control in the past three years will be reviewed, and future policies will be discussed. Specifically, the following practical problems and developments will be considered: (1) seeing all the population at surveys, and the possibility of including some other activity with the yaws campaign; (2) treating not only patients with active yaws, but also latent cases and contacts; (3) the dosage for mass campaigns; (4) the employment of auxiliary staff and their supervision; (5) resurveys to consolidate the gains of the previous mass treatment; and (6) post-campaign activities which will develop the general public-health services of the community and which will absorb the later stages of the yaws campaign.

Many of the large-scale yaws-control campaigns now under way throughout the world have been made possible by the co-operation with the national governments, at their request, of WHO, which provides technical advice, and of UNICEF, which supplies materials and equipment.

Participants in the conference in Enugu will come from many countries outside as well as within the WHO Region for Africa. Among the former are the British Solomon Islands, Fiji, Haiti, Indonesia, Malaya, Morocco, Netherlands New Guinea, the Philippines, Thailand, and Yugoslavia.

Second African Malaria Conference

The Second African Malaria Conference, convened by the World Health Organization, will be held in Yaba, Lagos, Nigeria, from 28 November to 6 December 1955. The First African Malaria Conference was held in Kampala, Uganda, five years ago.

The topics with which the conference will deal will be of interest to forty countries and territories. This meeting, like the first one, will have a technical rather than an administrative character. Malaria is still a problem far from being solved in many places south of the Sahara—a problem which calls for technical research rather than routine administrative measures. In fact, malaria in

continental Africa south of the Sahara is the greatest challenge facing malariologists at the present time.

Reports have been submitted already by the countries taking part in the conference. They show that out of an estimated population of 132 million, 116 million—that is, 88 per cent.—are living in malarious areas. The population protected by residual spraying with insecticides or other methods of control, such as anti-larval measures or suppressive drugs, amounts to only 14 million. Though these are only approximate figures, they indicate the magnitude of the problem of malaria in Africa.

An examination of the reports submitted by the governments concerned also reveals that in a few areas residual spraying has proved as effective in Africa as in other parts of the world, and that there have been some outstanding successes in the past five years. Malaria has practically disappeared from the island of Mauritius, which was notorious for epidemics in the past. Of the island's two vectors, *A. funestus* has been completely eradicated and *A. gambiae*, though still present, no longer seems to be a threat; it is possible that the old *gambiae* population, associated with man and carrying malaria, may have been wiped out by residual spraying like the entire *funestus* population. On the island of Madagascar, 3.6 million persons, nearly all the population living in malarious areas, were protected by residual spraying in 1953. The anti-malaria campaign has been successful: there has been a marked drop in the malariometric indices, and the eradication of malaria from this large island, 231 250 square miles (592 000 km^2) in area, is now in sight.

In continental Africa, however, no such success can be claimed. Conditions are particularly difficult due to the heavy rate of infection of *A. gambiae* and *A. funestus* in many areas. Central Africa has the highest sporozoite rates, the heaviest transmission, and the highest spleen and parasite rates in the world. Efforts are being made by the governments concerned, often with support from UNICEF and WHO, to control malaria under such difficult conditions. Residual spraying with insecticides has not been entirely effective, and drugs are being used in various projects together with insecticides.

The Lagos conference will afford an opportunity to examine the various methods of malaria control tried during the past five years and to select the most effective weapons with which to attack malaria in its African stronghold.

Expert Committee on Insecticides: Sixth Session

The sixth session of the Expert Committee on Insecticides is taking place in Geneva from 4 to 11 October 1955. This meeting will be devoted largely to questions relating to the equipment employed in the application of pesticides and to measures which might be taken to protect workers handling and applying these materials. The participants will have at their disposal the results of research performed by members of the Expert Panel on Insecticides over the past four years, as well as analyses of the observations made by field workers and manufacturers in many parts of the world on the efficiency and practicability of equipment designed in accordance with the specifications recommended by the Committee at its third session, in 1951. As a result, it is hoped that specifications for improved apparatus will become available in the report of the Committee. Particular significance is attached to such specifications at this time on account of the malaria eradication programme being supported by WHO and of the expansion of programmes for the control of other insect-borne diseases in many countries.

The Committee's agenda also contains items relating to equipment for the disinsectization of aircraft and to the preparation of standards of operational achievement for fogging and misting machines. The Committee will be requested to summarize experience in the use of, and to outline research on the application of, molluscocides and herbicides.

With the increasing use of toxic insecticides in health programmes, the protection of the

worker is becoming exceedingly important. The type of protective clothing, respirators, and other devices which may be used in field programmes to reduce accidents and intoxication will be among the considerations of the Committee.

The specifications recommended by the Committee will be provided in due course, free of charge, to all holders of the *Manual of specifications for insecticides and for spraying and dusting equipment.*

The following have been invited to attend this meeting: Mr S. H. Fryer, Chief Engineer, Ministry of Supply, Chemical Defence Experimental Establishment, Porton, United Kingdom; Mr L. B. Hall, Chief, Equipment Development Service, Technical Development Laboratories, Communicable Diseases Center, US Public Health Service, Savannah, Ga., USA; Mr J. A. Jove, División de Ingenieria Sanitaria, Dirección de Salud Pública, Ministerio de Sanidad y Asistencia Social, Caracas, Venezuela; Mr F. W. Knipe, Rockefeller Foundation, New Delhi, India; Mr A. T. Lemierre, Directeur-adjoint de la Station centrale d'Essais de Machines agricoles, Paris, France; Dr E. Mosna, Istituto Superiore di Sanità, Rome, Italy; and Mr Mahondus Houshang Rafatjah, Chief of Malaria Control for Iran, Ministry of Health, Teheran, Iran.

Meeting of Expert Committee on Drugs Liable to Produce Addiction

The next meeting—the sixth since 1949—of the Expert Committee on Drugs Liable to Produce Addiction will take place from 24 to 29 October 1955. The sequence of meetings of this committee—almost regularly once a year—is the result of the functions devolving on WHO in connexion with the international control of narcotics, e.g., the Director-General of WHO is bound, by the relevant international instruments, to decide, on the advice of an expert committee, whether a drug is capable of producing addiction or whether it is convertible into such a drug.

Nearly all of the new drugs on the status of which the committee will have to make a recommendation at its sixth session belong to the group of so-called " synthetics ", i.e., strongly analgesic substances which are not derivatives of morphine and which are now being synthetized and manufactured in an ever-increasing number. The committee will also deal with the important group of substances which can counteract the intoxicating effects of morphine, as well as of other narcotic drugs. Another subject for consideration will be the treatment of drug addicts, a topic of increasing significance in view of the disputed value of so-called " narcotics clinics ".

The following are expected to attend this session: Sir Ram Nath Chopra (India), Dr N. B. Eddy (USA), Professor G. Joachimoglu (Greece), Professor J. La Barre (Belgium), Professor B. Lorenzo-Velázquez (Spain), Professor T. Masaki (Japan), Dr J. R. Nicholls (England), and Professor V. Zapata Ortiz (Peru).

Third Session of Expert Committee on Professional and Technical Education

The third session of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel is being held in Geneva from 24 to 29 October 1955. This meeting will be devoted to study of problems related to the training of the auxiliary health worker, who has been defined as a " partly trained or partly qualified person who performs tasks which are generally entrusted to fully qualified professional workers ". The question of terminology and definition will occupy an important place on the agenda of the meeting.

Recognizing the widespread need to use partially trained health personnel in many of the " under-developed " countries, WHO has been encouraging and supporting efforts to develop and improve the training of such personnel. This subject has been considered in the technical discussions held in conjunction with the Fourth World Health Assembly, in May 1951, and, on a regional basis, in connexion with regional committee meetings.

The specific types of auxiliary workers needed for nursing and environmental sani-

tation work have already been studied by WHO, but there are many other fields in which auxiliary workers are used. The Committee will consider the basic conditions which call for the use of auxiliaries and will try to formulate principles for the establishment of training programmes for them. Experiences in the use of auxiliary health workers in countries at various stages of development are being collected and will help to give the discussions a practical basis. An effort will be made to determine ways of finding out in what situations auxiliary health workers are needed as either a temporary or a permanent feature of the health services of a country.

One of the most substantial contributions which WHO could make towards a better understanding of the role of the auxiliary health worker would be a basic, comprehensive formulation of the need for, and utilization and training of, this kind of worker. The coming session of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel will provide an opportunity for comparing experiences in many parts of the world and may result in recommendations which can serve as a guide for those responsible for training programmes for auxiliary health personnel.

The following are expected to participate in this meeting: Dr C. T. Loo (Taiwan), Dr Min Sein (Burma), Dr R. M. Morris (Southern Rhodesia), Dr V. Puntoni (Italy), Dr T. C. Routley (Canada), Dr J. Sénécal (Senegal), Dr Janet Mackie (Thailand), and Dr Leo A. Kaprio (Finland).

Investigation of Care of the Chronically Ill in Israel

Many beds in hospitals in Israel are occupied by the chronically ill, and, in an effort to find how much of this hospitalization is necessary, the Government asked WHO to send a consultant to study the situation and make recommendations. The Organization has therefore sent Dr Juan Moroder, of Chile, to Israel for six months to make a detailed study of the types of patients in Israeli hospitals, out-patient clinics, and in the care of various health agencies. If necessary, a one-day census will be made in hospitals to classify patients and discover how many are suffering from incurable, chronic diseases.

Dr Moroder, after holding several positions in the Ministry of Health of Chile, was appointed Professor of Public Health at the School of Public Health of Santa Fé, Argentina. In 1949 he was named Director of the School and remained in that post for several years. The appointment in Israel is not Dr Moroder's first with WHO: he spent two and a half years as statistician and programme analyst in the Regional Office for the Western Pacific, Manila, before undertaking his current assignment.

Singapore Nursing Project

Three nurses have been assigned to a WHO-aided project in Singapore in which the Government is making an effort to improve nursing education and nursing services. Miss Yvonne Ludgate, of England, has been appointed nurse educator in general nursing; Miss M. Chalmers, of Australia, as senior nurse educator; and Miss M. E. Hosking, of New Zealand, as nurse educator in midwifery.

Environmental Sanitation Project in the Philippines

With WHO assistance, the Government of the Philippines has initiated a programme designed to strengthen the present environmental sanitation services of the country. Mr Avner Goor, public health engineer, has been appointed by the Organization to act as technical and administrative adviser on environmental sanitation to the Department of Health. Mr. Goor will also assist in the training of professional and sub-professional personnel in environmental sanitation and in the development of a long-range plan in this aspect of public health for the whole country.

WHO Receives Voluntary Contribution from Brunei

Announcement has been made by the WHO Regional Office for the Western

Pacific that a voluntary contribution to the Organization of $3256.25 has been received from the Government of Brunei. Brunei, a Sultanate under the protection of the British Crown, made a similar donation last year, which was accepted with thanks by the WHO Executive Board at its fifteenth session (January 1955).

Review of WHO Publications

Pharmacopoea Internationalis, Editio Prima, Volumen II. World Health Organization, Geneva, 1955. xx + 350 pages. Price: £1 15*s*., $6.75, or Sw. fr. 20.—

The International Pharmacopoeia has been prepared with a view to fulfilling the desire, long felt by pharmacists and physicians throughout the world, for the establishment of recommended international specifications and nomenclature for pharmaceutical preparations in general use. Volume I was published in English and French in 1951, and in Spanish in 1954.

Volume II is now available in English and in French and will soon appear in Spanish. This volume consists of 217 monographs, 26 appendices, and 1 annex. It contains, among others, specifications for some of the pharmaceutical preparations introduced into therapeutics during the last decade (e.g., penicillin, chloramphenicol, dihydrostreptomycin, oxytetracycline) and for some synthetic substances of growing importance. It also comprises monographs on compressed tablets, sterile injections, and tinctures of substances included in Volume I.

In the appendices are descriptions of the relevant methods of assay for some of the substances in the volume, and, as in the first volume, a table giving the usual and maximal doses for adults of all the pharmaceutical preparations. In addition, for certain drugs in both volumes there is a table of usual daily doses for children. Another appendix contains a list of the International Biological Standards and Reference Preparations at present available.

An annex on solutions of cardiolipin and lecithin has been added, in view of the increasing use of these substances in serological tests.

The volume is provided with a detailed alphabetical index designed to cover both Volume I and Volume II.

Infant Nutrition in the Subtropics and Tropics. By D. B. Jelliffe. Geneva, 1955 (*World Health Organization: Monograph Series*, No. 29). 237 pages, 24 illustrations. Price: £1 5*s*., $5.00, or Sw. fr. 15.— (clothbound).

A lengthy, pre-publication review of this monograph has already appeared in a previous number of the *Chronicle* (*Chron. Wld Hlth Org*., 1955, **9**, 217).

Dried BCG Vaccine. By Yoji Obayashi. Geneva, 1955 (*World Health Organization: Monograph Series*, No. 28). 220 pages, 57 figures, 91 tables. Price : £1 5*s*., $5.00, or Sw. fr. 15.— (clothbound).

An article based on this monograph was published in *Chronicle of the World Health Organization*, 1955, **9**, 259.

Bulletin of the World Health Organization, 1955, Volume 12, Number 6 (pages 877-1116).

This number of the *Bulletin* contains the following articles : Serological analysis of venoms and antivenoms, by W. H. A. Schöttler ; Serological study of yaws in Java, by

Huan-Ying Li & R. Soebekti ; and Cholera studies : 4. Problems in immunology, by R. Pollitzer, & W. Burrows. In addition, there is a bibliographical section covering plague, relapsing fever, and international sanitary conventions and regulations.

Bulletin of the World Health Organization, 1955, Volume 13, Number 1 (pages 1-208).

The first number of Volume 13 of the *Bulletin* is devoted to : Cholera studies : 5. Bacteriophage investigations, by R. Pollitzer; Changes in the epidemiology of plague in Egypt, 1899-1951, by Abdel Gawad Hussein; Statistical observations on death-rates and causes of death in Korea, by Chai Bin Park; and three articles which are covered in the present *Chronicle*: Wild-rodent-flea control in rural areas of an enzootic plague region in Hawaii : a preliminary investigation of methods, by L. Kartman & R. P. Lonergan (see page 287) ; World survey of typhoid and paratyphoid-B phage types, by A. Felix (see page 280); and Typhoid and paratyphoid fevers from 1950 to 1954, a report prepared by the WHO Epidemiological and Morbidity Statistics Section (see page 283). It also contains a bibliographical section on typhus and related infections.

CORRIGENDUM

Vol. 9, No. 6

POLIOMYELITIS IN 1953

Page 156, fig. 1, legend

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	---------- *deaths*		
	———— *cases*	}	*USA*
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World Health Organization : Monograph Series No. 28

DRIED BCG VACCINE

YOJI OBAYASHI

1955; 220 pages, 57 figures, 91 tables

Price :
£1 5s. $5.00 Sw. fr. 15.— (Clothbound)

1. Cultivation and human inoculation tests
2. Cultivation test of BCG vaccine
3. Present method of production
4. Hand-shaking method of BCG production with crystal or agate balls
5. Culture period of BCG on Sauton medium
6. Method of freeze-drying
7. Effect of freeze-drying on potency of BCG vaccine
8. Effect of storage on viability and potency of BCG vaccine, with special reference to storage temperature
9. Effect of light on viability and potency of BCG vaccine
10. Effect of degree of vacuum on preservability of dried BCG vaccine
11. Effect of residual moisture on preservability of dried BCG vaccine
12. Viability and allergenic potency of mass-produced dried BCG vaccine

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World Health Organization : Monograph Series No. 29

INFANT NUTRITION IN THE SUBTROPICS AND TROPICS

D. B. JELLIFFE

1955; 238 pages, 24 figures, 2 colour plates, 8 tables

Price :
£1 5s. $5.00 Sw. fr. 15.— (Clothbound)

1. Evolution of infant feeding in the Western World
2. Present infant-feeding practices in the subtropics and tropics
3. Present status of nutritional disease among infants in the subtropics and tropics
4. Methods of improving infant feeding in the subtropics and tropics
5. Prevention of kwashiorkor
6. Nutrition education in the maternal and child health (MCH) centre

WHO Publications Needed...

There is a demand for certain WHO publications which are now out of print. It would be greatly appreciated if those in possession of copies of these publications which they do not need would return such copies to the Organization. The following are sought:

Chronicle of the World Health Organization, Vol. 9, No. 4 (April 1955) and these numbers in the *World Health Organization: Technical Report Series*—

No. 10 Report on the first session of the Expert Committee on Environmental Sanitation

No. 16 Report on the first session of the Joint FAO/WHO Expert Committee on Nutrition

No. 22 Report on the first session of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel

No. 25 Report on the second session of the Expert Committee on Health Statistics

No. 44 Report on the second session of the Joint FAO/WHO Expert Committee on Nutrition

No. 53 Third report of the Expert Committee on Health Statistics

No. 59 First report of the Expert Committee on Trachoma

The publications should be addressed to: World Health Organization, Division of Editorial and Reference Services, Palais des Nations, Geneva, Switzerland.